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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,136	11/18/2003	Jaishankar Moothedath Menon	ARC920030069US1	7019

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EXAMINER

PEIKARI, BEHZAD

ART UNIT	PAPER NUMBER
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2189

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/716,136

Applicant(s)

MENON ET AL.

Examiner

B. James Peikari

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-43 are objected to because of the following informalities: the claims should include the language "n and c being integer value numbers greater than zero". Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. The previous rejection under 35 USC § 101 is hereby withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 16, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi.

Regarding claims 1, 16, and 30, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 3, 8-9, 13-15, 18, 23-24, 28-29, 32, 37-38, 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Kaneda et al. (US Patent 5,958,067), hereinafter simply Kaneda.

(A) Regarding claims 3, 18, and 32, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 5 storage system. Kaneda teaches a method, wherein the RAID-configured storage system is configured as a RAID 5 storage system (column 1, lines 34-62). At the time of invention it would have been obvious to a person of ordinary skill in the art to

Art Unit: 2189

combine the Servi with Keneda. The motivation for doing so would have been an improved response performance and throughput (column 3, lines 51-56).

(B) Regarding claims 8, 23, and 37, Keneda teaches a method, wherein the redundancy information is an XOR-based code (column 11, lines 6-23).

(C) Regarding claims 9, 24, and 38, Keneda teaches a method, wherein the redundancy information is a one-dimensional parity (column 9, lines 24-33).

(D) Regarding claims 13, 28, and 42, Keneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are written consecutively (Fig. 1, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are written consecutively).

(E) Regarding claims 14, 29, and 43, Keneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are intermingled when written (Fig. 5, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are intermingled when written).

(F) Regarding claim 15, Keneda teaches a method, further comprising: receiving n data information sectors (Fig. 1, Data Area 391; column 7, lines 3-16); and

Art Unit: 2189

generating c redundant information sectors (Fig. 1, Parity Area 392; column 7, lines 3-16).

7. Claims 2, 4-7, 10-12, 17, 19-22, 25-27, 31, 33-36, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Hetzler et al. (US Patent Application 2005/0015700), hereinafter simply Hetzler.

(A) Regarding claims 2, 17, and 31, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 6 storage system. Hetzler teaches a method, wherein the RAID-configured storage system is configured as a RAID 6 storage system (Paragraph 34). At the time of

Art Unit: 2189

invention it would have been obvious to a person of ordinary skill in the art to combine the Servi with Hetzler. The motivation for doing so would have been an improved performance, protection and efficiency (See Hetzler, paragraph 20).

(B) Regarding claims 4, 19, and 33, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID 51 storage system (paragraph 35).

(C) Regarding claims 5, 20, and 34, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID 3+3 storage system (paragraphs 27 and 30).

(D) Regarding claims 6, 21, and 35, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID N+3 storage system (paragraph 34).

(E) Regarding claims 7, 22, and 36, Hetzler et al. teach a method, wherein the redundancy information is based on a Reed-Solomon code (paragraph 21 and 31).

(F) Regarding claims 10, 25, and 39, Hetzler et al. teach a method, wherein the storage unit is a hard disk drive (paragraph 27).

(G) Regarding claims 11, 26, and 40, Hetzler et al. teach a method, wherein the storage unit is an optical drive (paragraph 27).

(H) Regarding claims 12, 27, and 41, Hetzler et al. teach a method, wherein the storage unit is a random access memory (paragraph 27).

Response to Arguments

8. With regard to applicant's arguments included with the response filed on October 9, 2006, these have been carefully considered by the examiner but are not deemed to place the application in condition for allowance.

(A) With regard to the rejection under 35 USC § 101, the current examiner has withdrawn this rejection because there appears to be nothing in applicant's disclosure or remarks that states or suggests that the claimed "storage medium" is anything other than an article of manufacture.

(B) With regard to the rejections under 35 USC § 102(e), it is noted that parity data as used in data processing systems *is* redundancy data associated with the data that it is meant to protect. The meaning of "parity" as used in RAID systems was specifically defined as such by the RAID Advisory Board (now disbanded). In fact, any prior art RAID system that utilized parity data would have taught claims 1, 16 and 30.

(C) As to the rejections under 35 USC § 103(a), the technical analyses provided in applicant's remarks are quite astute.

However, all of the arguments presented on pages 9-12 of the remarks rely on the *bodily incorporation* of two systems (i.e., Servi and Keneda; Servi and Hetzler), which does not reflect the combinations suggested by the rejections. In the rejections, the secondary references are included because only particular features of those references are meant to be incorporated into the Servi system (e.g., RAID 6, RAID (3+3), RAID 51, etc.), as outlined in the rejections. Applicant has already admitted that many of these particular features were known in the prior art (note pages 1-3 of applicant's specification). The examiner agrees. The various RAID configurations and error correction codes recited in the claims were abundantly well known as common storage options in the art of digital data storage at the time of the invention.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).



B. James Peikari
Primary Examiner
Art Unit 2189
12/28/06